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No.	Constellation and Object.	R.A.	Dec.	Position-Angle.	Distance.	Epoch.	Page.
		h m	° ′	° ′	″		
44	Aquilæ (B & C)	18 54	− 0 55	76 0	1·576	1847·60	176
45	Aquilæ	18 57	+ 6 18	152 28	9·492	1847·65	176
46	23 Aquilæ	19 10	+ 0 48	12 9	3·57	1847·67	177
47	Aquilæ (A & B)	19 28	−10 46	319 4	2·54	1847·60	176
48	„ (A & C)	„ „	„ „	169 17	...	...	176
49	Aquilæ	19 37	+10 23	276 36	4·33	1847·72	177
50	π Aquilæ	19 41	+11 25	123 9	1·20	1847·66	176
51	α^2 Capricorni	20 9	−13 2	144 11	6·36	1846·67	195
52	ρ „	20 19	−18 20	176 56	3·094	1847·70	195
53	XX Piazzi, 376 Equulei	20 47	+ 3 55	287 45	1·874	1847·65	189
54	ε Equulei (A & B)	20 51	+ 3 41	288 6	0·574	1847·60	189
55	„ „ (A & C)	„ „	„ „	76 25	11·08	1847·60	189
56	λ „	20 54	+ 6 33	227 42	1·9	1847·60	189
57	12 Aquarii	20 55	− 6 27	191 30	8·23	1847·63	192
58	61 Cygni	20 59	+37 58	101 2	17·3	1847·50	167
59	29 Aquarii	21 53	−17 43	242 8	4·466	1847·70	192
60	41 „	22 5	−21 51	120 22	4·326	1847·70	193
61	Pegasi	22 6	+16 24	331 29	8·03	1847·65	188
62	ζ Aquarii	22 20	− 0 50	346 42	3·948	1847·70	193
63	37 Pegasi	22 21	+ 3 37	121 46	0·98	1847·70	188
64	Aquarii	22 34	− 9 8	314 35	1·82	1847·70	193
65	Piscium	23 37	− 0 37	227 33	2·702	1847·65	35

On the Space-penetrating Power of Mr. Lassell's 2-foot and 4-foot Reflectors. By W. Lassell, Esq.

In the *Monthly Notices* for December is a note by M. Otto Struve, in which, quoting from a previously written paper, he says, "The space-penetrating power of Mr. Lassell's new (4-feet) instrument can hardly be estimated superior to that of ours (the Pulkova 15-inch) Refractor." There appears to me to be something so erroneous in this conclusion, that although very averse to controversy, and especially to enter the lists with my very distinguished friend, M. Struve, I crave permission to state my greatly differing opinion, and the grounds on which I have formed it.

To begin with a comparison of the powers of my 2-foot Equatoreal with those of the Pulkova telescope. About the year 1847 and later, I was engaged, as opportunities offered, in a diligent scrutiny with the view of verifying the fainter Satellites

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of *Uranus*, presumed to have been discovered by the late Sir William Herschel. It would appear from Professor Struve's communication to the *Monthly Notices*, vol. viii., pages 44 and 139, that he was then engaged in the same careful search; and he announces, with some confidence, his verification or re-discovery of at least one of Herschel's satellites, namely, that whose period was announced by Herschel to be $5^{d}\ 21^{h}\ 25^{m}$, adding that he had no doubt of the identity of the two objects, and that his observations "completely prove the existence of Herschel's first supplementary satellite." Yet the detailed observations at page 46 do not seem to me sufficiently exact or consistent to justify this conviction; and certainly the long series of supplementary observations of the Satellites of *Uranus* has made the conclusion irresistible that this rediscovery must be given up, and that the Pulkova telescope was not equal to the task then set before it.

The interior faint satellites, now recognised as *Umbriel* and *Ariel*, were first certainly seen by me in 1847, but I was not able to give what I thought a sufficiently distinct account of them until 1851; and I would especially direct attention to my letters of the 13th and 29th November in the latter year (*Monthly Notices*, vol. xii., page 15), as proving by the precision, certainty, and frequency with which the objects were seen, that the 2-foot Reflector must have been even greatly superior to the 15-inch Refractor. I may, perhaps, add also the opinion of the late Mr. G. P. Bond, expressed verbally to myself, that my 2-foot telescope was sensibly more efficient than the Harvard Telescope, which may be called a facsimile of that at Pulkova.

I will now refer to vol. xxxvi. of the *Memoirs*, containing the record of my observations at Malta with the 4-foot Equatoreal, as proving the superiority of that telescope in illuminating or "space-penetrating" power, to the 2-foot Equatoreal.

At page 34 an observation of *Uranus* and his Satellites is recorded, together with an expression of my opinion of the comparative efficiency of these telescopes on these objects, and asserting the great superiority of the 4-foot. Again, at page 36, on September 27th there is recorded an observation of *δ Cygni*, in which the 2-foot is again mentioned, with a remark in favour of the 4-foot. Further, at pages 7 and 8, observations of the Satellite of Neptune made on August 2nd, September 22nd, and October 19th, are given, when the satellite was observed nearer to the limb of the planet than it had ever been seen in the 2-foot. Moreover, I may remark that the observation of a faint satellite very near to its primary in two telescopes differing greatly in size, tells disproportionately against the larger one; since the greater brightness of the planet diminishes the sensibility of the eye for detection of the satellites—in addition also to the greater disturbance of the atmosphere with the larger aperture.

Lastly, in further corroboration of the superiority of the 4-foot, I may suggest a comparison of the figured Nebulæ in this volume with such of them as are contained in vol. xxiii.

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of the *Memoirs*, in my paper giving observations with the 2-foot.

I conclude with remarking that Professor Struve's unfavourable impression may perhaps in some degree have arisen from his visit to Malta having been made at a time of the year when the atmosphere is occasionally much disturbed by storms, which are of course greatly to the disadvantage of a very large telescope.

Ray Lodge, Maidenhead,
1877, *January* 23.

The Specular Reflexion Hypothesis, and its bearing on the Transit of Venus. By John Brett.

There was a phenomenon observed at the transit of *Venus* (the ring of light at the planet's limb), which, as far as I know, has not hitherto been explained, and my present purpose is to show that the specular reflexion hypothesis has an important bearing on this subject. If, in addition to a burnished reflecting surface, we suppose *Venus* to have a translucent envelope of great density, it appears to me that all the elements necessary for a complete explanation of the mystery are at hand; at all events, it is possible on these terms to produce a very similar phenomenon experimentally.

In my last I ventured to suggest a reason for believing the surface of the planet to be in a molten or vitrified state.

That suggestion was peculiarly fortunate in having attracted the attention of Mr. Christie, whose investigations afford, at all events, invaluable data for studying the subject, if not (as I believe) a complete confirmation of the hypothesis. *Vide* last Number of the *Monthly Notices.*

The theory of specular reflexion is, of course, perfectly well understood, and its phenomena in the case of *Venus* and the Sun would occur as follow:—At superior conjunction we should see merely a small circular image of the Sun. In the course of the planet's progress in its orbit, this image would move in longitude and extend itself in latitude, assuming a cusped crescent form. Near the time of inferior conjunction it would approach the limb, and present an extremely attenuated rim of light. At transit this rim would completely encircle the disk, and theoretically would never entirely disappear. Even practically, the Sun's light near his limb is so much weaker than at the centre, that it is quite conceivable that the ring, or reflected image, might be observed during the earliest and latest stages of the transit. The position this ring would occupy within the planet's limb can of course be determined with accuracy by a calculation based on the relative diameters of the Sun and planet.

So far the theory is simple, and has been so well understood for ages that no illustration is needed.

It will, however, be perceived that any expansion in latitude of this extremely attenuated ring which might have been ob-